

Using Forces Yr 8 Key Concepts time 6 weeks max

Name: _____

Key Concept	Vocab			Assessments	Sign off	
<ol style="list-style-type: none"> 1. A force is a push or a pull. Simple machines use less force or change the direction of a force. 2. Levers are force multipliers or speed multipliers 3. Mechanical advantage is the load divided by the effort. (or the distance of the effort from the fulcrum divided by the distance of the load from the fulcrum) 4. A wheel is a bent lever that rotates around the axle (fulcrum) Gears are a special kind of wheel 5. Pulleys can be used to reduce the effort required to lift a load. We can calculate work and Mechanical advantage 	Simple machines Ramp Lever Inclined plane Screw Force Effort Load Work = force X distance Mechanical advantage = Load / Effort	Pulley wheel torque gear Lever fulcrum teeth		Assessments for this topic <input checked="" type="checkbox"/> 1 prac <input checked="" type="checkbox"/> 1 Prac test <input checked="" type="checkbox"/> 1 Make a machine that combines 2 simple machines	Done at school	Done at Home
Priority 1	Suggested Activity			Extension and variation		
8.1 Simple Machines <ul style="list-style-type: none"> A force is a push or a pull. Simple machines use less force or change the direction of a force. Calculate work and mechanical advantage. 	<ul style="list-style-type: none"> Watch this video and list all the simple machines http://oxleylearning.org/science/2008/02/29/simple-machines/ Practical 8.1 p 245 Questions 1 to 17 Hmwk book 8.1 			Ques 17 to 27 Science at work p 244		
8.2 Levers <ul style="list-style-type: none"> Levers are force multipliers (Class 1 and 2) Correctly use terms fulcrum, effort, load Levers are speed multipliers (Class 3) Calculate Mechanical advantage and work done 	<ul style="list-style-type: none"> Use a variety of levers and draw them to show the effort and load and fulcrum Draw and label examples of a Class 1 lever, a Class 2 lever and a Class 3 lever. p249 Q 1 to 10 p250 Q 17 to 19 do at least 2 of the following pracs Prac 1 -p251 Prac 2 - p252 Prac 3 - p253 Hmwk - 8.2 			<ul style="list-style-type: none"> Surfing - p257 Constructing p 257 		

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Priority 1	Suggested Activity	Extension		
8.3 Wheels axles and gears <ul style="list-style-type: none"> Wheels and axles Gears Calculate Mechanical advantage and work done 	<ul style="list-style-type: none"> Construct a table to compare Wheels as force multipliers and Speed multipliers include examples of each (p258 to 259) Draw and label a gear system - see p260 Play with the Lego gears - new equip available, mouse trap racer, or cotton reel racer Write a paragraph on how Gears can be used as a force multiplier or a speed multiplier Questions p 261- 1 to 10 and Q17 and 18 Hmwk 8.4 	<ul style="list-style-type: none"> Use the STELR Windmills to explore gearing and power output Hmwk 8.5 		
8.4. Pulleys <ul style="list-style-type: none"> Single pulleys change direction of a force Multiple pulleys use a small effort to lift a large load Calculate Mechanical advantage and work done 	<ul style="list-style-type: none"> Draw examples of single pulley systems and label the effort and load Draw examples of a multiple pulley system and label the effort and the load Prac 1 p 268 Prac 2 p 269 Use the formula $\text{Work} = \text{effort force} \times \text{the distance moved}$ to calculate the work done in Prac 2 - how does this compare to the results gained from the prac. p267 Ques 1 to 10 and Q 14 and 16 Hmwk 8.6 and 8.7 	<ul style="list-style-type: none"> More on Prac 2 - What are Newtons and why are they used in this topic? Prac 3 - p270 Prac 4 - p271 		
Putting it all together Use the things you have learnt - This is an assessment task	<ul style="list-style-type: none"> Practical exam: Look at the box of kitchen utensils and tools - Construct a table to classify the items in terms of what type of machine it is and whether it multiplies speed or force. Use formula to calculate the work and mechanical advantage of one item. Construction Assessment: Using the ideas you have learnt create/build a machine that combines 2 or more simple machines. Use any of the following to Build our creation <ul style="list-style-type: none"> paddle popstick, toothpicks, skewers string and some glue or sticky tape 			

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